

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. A program circuit comprising:
a comparator for comparing output data of a data input buffer with output data of a sense amplifier bit by bit, and for outputting a re-program operation signal if the data are different from each other;
a data latch circuit for latching the comparing results of the output data of said data input buffer and the output data of said sense amplifier;
a control circuit for generating a high voltage for receiving the output data of said data input buffer and the data latched at said data latch circuit, respectively, and for outputting a signal for applying a program bias voltage to a memory cell which has not been completely programmed in response to a power-up reset signal and program state signal.
2. The program circuit as claimed in claim 1, wherein said comparator includes a plurality of exclusive-NOR gates to which output data of said data input buffer and output data of said sense amplifier, respectively, and a NOR gate for logically combining the output signals of said exclusive-NOR gates.
3. The program circuit as claimed in claim 1, wherein said data latch circuit includes a plurality of flip-flops, each flip-flop having a data input terminal to which comparing results of the output data of said data input buffer and the output data of said sense amplifier, a clock signal input terminal to which a program state signal and a reset signal input signal to which power-up reset signal/program state signal/read mode signals are inputted.
4. The program circuit as claimed in claim 1, wherein said control circuit for generating a high voltage includes a plurality of NOR gates to which output data of said data latch circuit and a power-up reset signal are inputted, respectively; a plurality of inverters to

which output data of said data input buffer is inputted; and a plurality of NAND gates to which the output signals of said NOR gates, the output signals of said inverters and the program state signal are inputted, respectively.

5. The program circuit as claimed in claim 1, wherein said comparator includes eight exclusive-NOR gates to compare the output data of said data input buffer and the output data of said sense amplifier.

Cancel claims 6-16.

17. (amended) A non-volatile memory device, comprising:
a plurality of memory cells;
an input component coupled to the memory cells and configured to program first
information into the memory cells; and
a program circuit configured to reprogram only the memory cells that have not
been properly programmed, the program circuit including:
_____ a first circuit to determine if the first information has been properly
programmed into the memory cells, and
_____ a second circuit to transmit a signal to initiate reprogramming of any
memory cells that has not been properly programmed.

18. The non-volatile memory device of claim 17, wherein the first information
is no more than four bits of data and are programmed in parallel.

19. (amended) The non-volatile memory device of claim 17, wherein the first
information is no more than two bits of data and are programmed in parallel, wherein the first
circuit is a comparator, the second circuit is a control circuit, wherein the program circuit further
includes a data latch circuit for storing information according to the determination made by the
first circuit.

Canceled claims 20-22.

23. A semiconductor device, comprising:
a plurality of memory cells;
an input component coupled to the memory cells and configured to program the
memory cells;
a comparator to determine whether first information of the input component has
been properly programmed into the memory cells, the comparator having a logic gate to output a
first signal to indicate whether or not a reprogramming operation is needed, wherein the first
information is N bits of data;
a controller coupled to the comparator and configured to output a second signal to
initiate reprogramming of M number of the memory cells, where M is less than N,
wherein the comparator compares the first information of the input component
with second information read from the memory cells,
wherein N is eight and the input component is configured to transmit a byte of
information at a time to the memory cells, and
wherein the comparator includes a plurality of XNOR gates having first and
second input ports, the first input ports being configured to receive the first information and the
second input ports being configured to receive the second information, wherein outputs of the
XNOR gates indicate whether the first information and the second information are the same.

24. The device of claim 23, wherein the comparator includes N number of the
XNOR gates.

25. (amended) The device of claim 23, wherein the comparator further
includes:
a logic gate coupled to the outputs of the XNOR gates, the logic gate configured
to output the second signal; and
a data latch circuit for latching the compared results of the comparator.

26. The device of claim 23, further comprising:

a sense amplifier coupled to the memory cells, wherein the sense amplifier provides the second information to the second input ports of the XNOR gates.

27. The device of claim 26, further comprising:
a latch configured to receive information relating to the first information of the input component.

28. The device of claim 27, wherein the latch receives the outputs of the XNOR gates.

29. The device of claim 28, wherein the latch includes N number of flip-flops to receive the outputs of the XNOR gates.

30. The device of claim 27, wherein the information received by the latch is the first information of the input component.

31. The device of claim 27, wherein an output of the latch is transmitted to the controller.

32. The device of claim 31, wherein the first information of the input component is transmitted to the controller.

33. The device of claim 32, wherein the first information and the output of the latch are eight bits of data, respectively, where the controller outputs eight signals in response to receipt of the first information and the output of the latch, the eight signals having one or more signals of first type to initiate reprogramming of corresponding one or more memory cells that have not been properly programmed and one or more of signals of second type to disable reprogramming of corresponding one or more memory cells that have been properly programmed.

Canceled claim 34-40.

41. A non-volatile semiconductor device, comprising:

a plurality of memory cells;
a sense amplifier coupled to the memory cells to read information written into the
memory cells;
an input data buffer coupled to the memory cells and configured to transmit N bits
of information at a time into the memory cells;
a comparator having a plurality of logic gates to compare bit-by-bit first
information of the input data buffer with second information of the sense amplifier and output a
reprogram operation signal if the first information and the second information are different;
a data latch circuit coupled to outputs of one or more of the logic gates of the
comparator; and
a controller having a plurality of logic gates and being configured to receive the
first information of the input data buffer and outputs of the data latch circuit, and output a signal
for applying a program bias voltage to any memory cell that has not been properly programmed.

42. The non-volatile device of claim 41, wherein the plurality of logic gates of
the controller include a first set of logic gates of N numbers corresponding to the N bits of
information programmed into the memory cells, the first set of logic gates being configured to
output a high voltage signal for any bit of information that has not been properly programmed
into the memory cells.

43. The non-volatile device of claim 42, wherein the signal for applying the
program bias voltage is a low voltage signal.

44. A non-volatile semiconductor device, comprising:
a plurality of memory cells;
a sense amplifier coupled to the memory cells;
an input data buffer coupled to the memory cells and configured to write N bits of
information at a time into the memory cells;
a comparator having N number of XNOR gates corresponding to the N bits of
information being written into the memory cells, the comparator being configured to compare

bit-by-bit N bits of first information of the input data buffer with N bits of second information of the sense amplifier and output a rewrite operation signal if any bit of the first information and the second information is different from each other;

a data latch circuit coupled to the comparator to receive outputs of the XNOR gates; and

a controller having a plurality of logic gates and being configured to receive the first information of the input data buffer and outputs of the data latch circuit, and configured to output a signal for applying a bias voltage to any memory cell that has not been properly written,

wherein the plurality of logic gates of the controller include a first set of logic gates of N numbers corresponding to the N bits of information written into the memory cells, the first set of logic gates being configured to output a high voltage signal for any bit of information that has not been properly written into the memory cells.

Canceled claims 45-49.